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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,832

02/17/2006

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HH 307-KFM

4888

10037 7590 12/12/2007
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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT

PAPER NUMBER

2881

MAIL DATE

DELIVERY MODE

12/12/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,832

Applicant(s)

KOLLMER ET AL.

Examiner

Phillip A. Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5-12-2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

1. This Office Action is submitted in response to the application filed 2-17-2006, wherein claims 1-7 are pending.

Claims Rejection – 35 U.S.C. 103

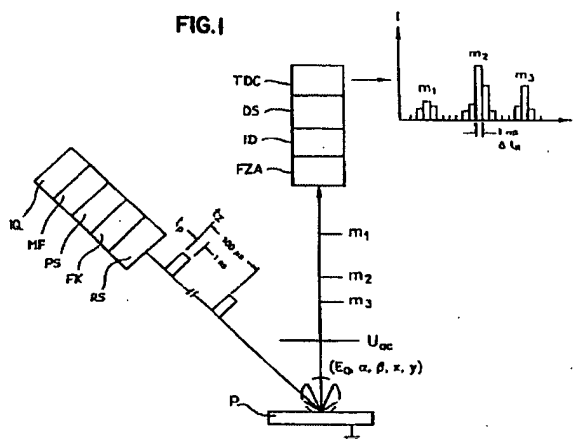
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,633,4957 to Neihuis, in view of Orloff, USPN 4,426,582, and in further view of Van De Walle et al, "Study of $\text{Bi}_n^{\text{P}+}$ ions formed in liquid-metal ion sources", Phys. Rev. 1987.

4. Regarding claims 1-4, and 6, Niehuis teaches a mass spectrometer for analysis of secondary ions and post-ionized neutral secondary particles comprising; (a) an ion source to create a primary ion beam to irradiate a sample and create secondary particles, and (b) a spectrometer unit for mass analysis of the secondary particles, where a mixed ion beam is filtered using a filtering device to form of a mass-pure ion beam. See Abstract; and Col. 4, line 18-54, where Niehuis teaches an ion source IQ for producing primary ions, and a time-of-flight secondary ion mass spectrometer for analysis of mass spectra of secondary ions released from the surface of a sample which is bombarded at regular intervals with primary-ion pulses that are first filtered by mass filter MF before striking the sample P. All secondary ions released by the primary-ion beam are accelerated to the same level of energy E (Note

by the primary-ion beam are accelerated to the same level of energy E (Note Figure 1 below). Their running time is then measured in a time-of-flight analyzer FZA with spatial and temporal focusing properties. Identification is through an appropriate time-resolving ion detector ID.



5. Niehuis fails to teach the use of said source possessing a heatable ion emitter that is coated in the area exposed to the field with a liquid-metal layer that contains an ionizable metal that is emitted and ionized as the primary ion beam, whereby wherein the primary ion beam contains metal ions with various stages of ionization and cluster statuses, characterized in that the liquid metal layer is essentially comprised of pure metallic Bismuth or of a low-melting-point alloy containing, in essence, Bismuth, wherein a Bismuth ion mixed beam can be emitted by the ion emitter under the influence of an electric field,

6. Orloff teaches a liquid metal ion source having Emitter 11B, which is coated with liquid metal, such as Bismuth, which is ionized at the tip of emitter and produces a

bright reliable beam with angular intensity current values of 10^{-4} to 10^{-5} amperes per steradian. See Col. 4, line 1-14; Col. 10, line 1-18; and col. 6, line 12-31.

7. Orloff modifies Niehuis to provide a simple drawn tungsten field emitter coated with Bismuth.

8. Therefore, it would have been obvious to one of ordinary skill that Niehuis would use the coated emitter of Orloff to provide a Bismuth coating that is a well wetted and continuous film that coats both the emitter shaft and shank.

9. The combination Niehuis and Orloff fails to teach the use of a Bismuth mixed ion beam including a number of Bismuth ion types, whose mass is a multiple of monatomic singly or multiply charged Bismuth ions Bi_1^{p+} , is to be filtered out using a filtering device in the form of a mass-pure ion beam that is solely comprised of ions of a type Bi_n^{p+} , in which $n \geq 2$ and $p \geq 1$, and n and p are each a natural number.

10. Van de Walle teaches the use of a liquid metal ion source and SIMS to obtain a complete energy distribution Bi_n^{p+} spectra (Note Figure 1 below). See page 5509.

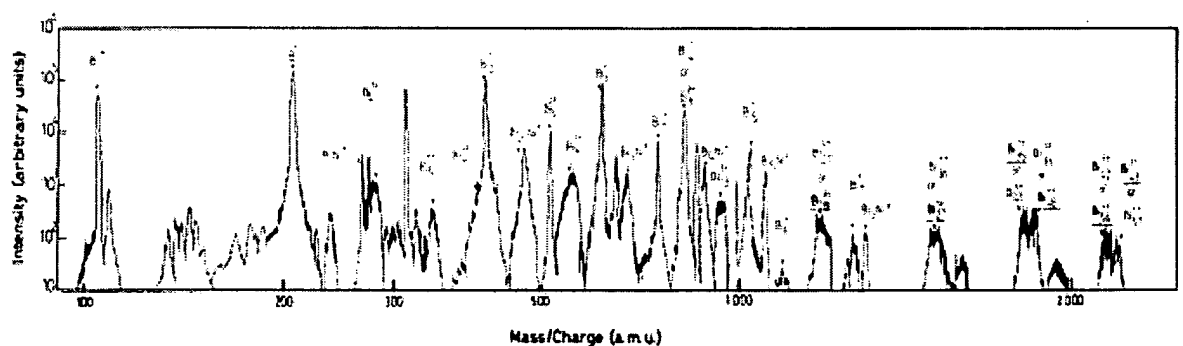


FIG. 1. Bi_n^{p+} mass spectrum. In the $n/p \leq 5$ region, the narrow peaks correspond to $p=1$ or 2 and the broad peak to $p=3$. In the $n/p \geq 5$ region, as the existence of Bi_n^{4+} ions becomes possible (it is forbidden in the preceding region by Coulomb explosion) we give two possible identifications with $p=3$ or $p=4$ for the broad peaks, the underlined values seem more likely (see the text). Sometimes the two identifications correspond to two different n/p values compatible with the peak width.

11. Van de Walle modifies Niehuis to provide an analysis of the energy distribution of Bismuth where the individual charge states produce a regular odd-even alternation, and where different charge states are produced by different emission mechanisms.

12. Therefore, it would have been obvious to one of ordinary skill that Niehuis and Orloff would use the Bi_n^{p+} spectral analysis of Van de Walle to provide a model for defining the process by which certain charge states are produced by a liquid metal ion source.

13. Regarding claims 5 and 7, the combination of Niehuis, Orloff and Van de Walle also teaches a liquid metal ion source using a Bi-Pb alloy. See page 5512 in Van de Walle.

Conclusion

14. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

December 26, 2007


ROBERT KIM
SUPERVISORY PATENT EXAMINER